

REMARKS

The Office Action dated August 29, 2008 has been received and carefully noted. The above amendments to the specification, and the following remarks, are submitted as a full and complete response thereto.

Claims 1, 5-18, and 20-23 are currently pending in the application and are respectfully submitted for consideration.

The Office Action objected to the specification, specifically alleging that the title of the invention is not descriptive. Applicants respectfully submit that the specification has been amended to replace the title "Speech Codecs" with the title "Method and Apparatus for Encoding Speech." Applicants further submit that the amendment effectively moots the objection, and respectfully request that the objection be withdrawn.

The Office Action rejected claim 22 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action further inquired whether the claim is a program or a method. This rejection is respectfully traversed for at least the following reasons.

Applicants respectfully submit that claim 22 is not indefinite. Claim 22 recites "[a] computer program comprising a code sequence which, when executed on a computer, encodes speech by implementing a method, the method comprising..." and claim 22 further recites the steps of the method. (emphasis added). MPEP 2106.01 states that "[w]hen a computer program is claimed in a process where the computer is executing

the computer program's instructions, USPTO personnel should treat the claim as a process claim." (MPEP 2106.01 – Computer-Related Nonstatutory Subject Matter, *I. Functional Descriptive Material: "Data Structures" Representing Descriptive Material Per Se Or Computer Programs Representing Computer Listings Per Se*).

Thus, Applicants respectfully submit that claim 22 is not indefinite. Accordingly, Applicants respectfully request that the rejection be withdrawn.

The Office Action rejected claim 22 under 35 U.S.C. § 101 as allegedly being directed toward non-statutory subject matter. Specifically, the Office Action alleged that the claim is directed to a computer program, and that a computer program is non-statutory. This rejection is respectfully traversed for at least the following reasons.

Applicants respectfully submit that the Office Action's statement that a computer program is non-statutory is not correct. The Federal Circuit has repeatedly held that a computer program is patentable.

For example, in *State St. Bank & Trust Co. v. Signature Fin. Group. Inc.*, 149 F.3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998), the Federal Circuit held that the transformation of data representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constituted a practical application of a mathematical algorithm (and thus, was patentable) because it produced a useful, concrete, and tangible result. (See *State St. Bank & Trust Co. v. Signature Fin. Group. Inc.*, 149 F.3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998), *cert denied*, 525 U.S. 1093 (1999)).

Furthermore, in *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999), the Federal Circuit held that computer-based programming constitutes patentable subject matter so long as the basic requirements of 35 U.S.C. § 101 are met, i.e. whether the algorithm-containing invention, as a whole, produces a tangible and useful result. (See *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 USPQ2d 1447, 1450 (Fed. Cir. 1999), *cert denied* 528 U.S. 946 (1999)).

Finally, in *In re Bilski* (2007-1130 Slip Opinion) while modifying portions of its previous decisions in *State St.* and *AT&T*, the Federal Circuit rejected a per-se restriction against computer program claims, thus maintaining that computer programs may constitute patentable subject matter. (See *In re Bilski*, 2007-1130 Slip Opinion).

Additionally, MPEP § 2106.01 states that when functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory since use of technology permits the function of the descriptive material to be realized. (See MPEP § 2106.01 – Computer-Related Nonstatutory Subject Matter).

Thus, the Office Action's reasoning is insufficient to support a prima facie case of unpatentability under 35 U.S.C. § 101. Accordingly, Applicants respectfully request that the rejection be withdrawn.

The Office Action rejected claims 1, 5-18, 20, 21, and 23 under 35 U.S.C. § 102(e), as allegedly being anticipated by Thyssen et al. (U.S. Patent No. 6,633,841) (“Thyssen”). The rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 5-12 are dependent, recites a method, which includes receiving a speech signal including voice signals and background signals, and detecting voice activity and providing an indicator when no voice activity is detected. The method further includes encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector. The method further includes, when the indicator is not present, outputting a first parametric representation of the speech signal comprising the plurality of parameters, and, when the indicator is present, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter.

Claim 13, upon which claims 14-17 are dependent, recites an apparatus, which includes an input configured to receive a speech signal including voice signals and background signals, and a voice activity detector configured to detect voice activity and to provide an indicator when no voice activity is detected. The apparatus further includes an encoder configured to encode the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising of a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based

on open-loop lag value, and a residual vector. The apparatus further includes modifying circuitry configured to modify, when the indicator is present, at least one parameter of the plurality of parameters, and an output configured to output a first parametric representation of the speech signal when the indicator is not present, the first parametric representation comprising the plurality of parameters, and configured to output a second parametric representation of the speech signal when the indicator is present, the second parametric representation comprising the modified parameter.

Claim 18 recites an apparatus, which includes receiving means for receiving a speech signal including voice signals and background signals, and detecting means for detecting voice activity and providing an indicator when no voice activity is detected. The apparatus further includes encoding means for encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector. The apparatus further includes outputting means for, when said indicator is not present, outputting a first parametric representation of the speech signal comprising said plurality of parameters, and, when the indicator is present, modifying at least one of the parameters and outputting a second parametric representation of the speech signal including the modified parameter.

Claim 20, upon which claim 21 is dependent, recites a network entity, which includes an input configured to receive a speech signal including voice signals and

background signals, and a voice activity detector configured to detect voice activity and to provide an indicator when no voice activity is detected. The network entity further includes an encoder configured to encode the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector, and modifying circuitry configured to modify, when the indicator is present, at least one parameter of the plurality of parameters. The network entity further includes an output configured to output a first parametric representation of the speech signal when the indicator is not present, the first parametric representation comprising the plurality of parameters, and configured to output a second parametric representation of the speech signal when the indicator is present, the second parametric representation comprising the modified parameter.

Claim 22 recites a computer program comprising a code sequence which, when executed on a computer, encodes speech by implementing a method. The method includes receiving a speech signal including voice signals and background signals, and detecting voice activity and providing an indicator when no voice activity is detected. The method further includes encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector. The method further includes, when the indicator is not present, outputting a first parametric representation of

the speech signal comprising the plurality of parameters, and, when the indicator is present, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter.

Claim 23 recites a system, which includes an input unit configured to receive a speech signal including voice signals and background signals, and a voice activity detector configured to detect voice activity and to provide an indicator when no voice activity is detected. The system further includes an encoder configured to encode the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector, and a modifying unit configured to modify, when the indicator is present at least one of the parameters. The system further includes an output unit configured to output, when the indicator is not present, a first parametric representation comprising said plurality of parameters, and to output a second parametric representation of the speech signal when the indicator is present, the second parametric representation comprising the modified parameter.

As will be discussed below, Thyssen fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the features discussed above.

Thyssen generally discloses an extended signal coding system that accommodates substantially music-like signals within a signal while maintaining a high perceptual quality in a reproduced signal during discontinued transmission (DTX) operation. More

specifically, Thyssen discloses a speech signal coding method 900 that performs speech signal coding, dependent upon the statistical analysis of the use of either forward linear prediction coefficients or backward linear prediction coefficients. The speech signal is analyzed in a block 910. In a block 920, forward linear prediction and backward linear prediction is performed on the speech signal. At block 930, it is determined whether the forward linear prediction or the backward linear prediction is to be used to perform the speech signal coding of the speech signal. Subsequently, in block 935, a statistical analysis of the backward linear prediction usage is performed against a predetermined threshold, and an output flag is generated within a block 930 that indicates the usage of either forward linear prediction or backwards linear prediction. (See Thyssen at Abstract and col. 13, lines 43-62; FIG. 9).

A decision block 940 directs the speech coding method 900 to select a speech signal coding from among a predetermined number of methods to perform speech signal coding, as shown in block 970, if the predetermined statistical threshold is not met. (Note: The disclosure of Thyssen indicates that a speech signal coding is selected if the threshold is met, but this appears to be a typographical error, in light of Figure 9 and the context of the disclosure of Thyssen). Alternatively, if the predetermined statistical threshold is met, any voice activity detection decision that is employed in the speech signal coding method 900 is overridden in a block 950. (See Thyssen at col. 14, lines 1-20).

Applicants respectfully submit that Thyssen fails to disclose, teach, or suggest, all of the elements of the present claims. For example, Thyssen fails to disclose, teach, or suggest, at least, *“detecting voice activity and providing an indicator when no voice activity is detected,” “encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector,”* and *“when the indicator is not present, outputting a first parametric representation of the speech signal comprising the plurality of parameters, and, when the indicator is present, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter,”* as recited in independent claim 1, and similarly recited in independent claims 13, 18, 20, and 22-23.

The Office Action, citing Figure 9 of Thyssen, took the position that block 950 of Thyssen discloses the limitation, *“detecting voice activity and providing an indicator when no voice activity is detected,”* as recited in independent claim 1, and similarly recited in independent claims 13, 18, 20, and 22-23. Applicants respectfully submit that the Office Action’s position is incorrect. As described above, Thyssen discloses that block 950 overrides any voice activity detection decision that is employed in the speech signal coding when the statistical analysis of the usage of the backward linear prediction meets the predetermined statistical threshold. (see Thyssen at col. 14, lines 15-20). Thus, the cited portion of Thyssen merely discloses that a voice activity detection

decision may be overridden. The cited portion of Thyssen fails to disclose, or suggest, providing an indicator when no voice activity is detected.

The Office Action further took the position that block 970 of Figure 9 of Thyssen discloses the limitation “*encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector,*” as recited in independent claim 1, and similarly recited in independent claims 13, 18, 20, and 22-23. Applicants respectfully submit that this position is also incorrect. As described above, Thyssen discloses that at block 970, a speech signal coding is selected from a predetermined number of methods to perform speech signal coding. Thyssen further discloses a list of example speech signal codings. (See Thyssen at col. 14, lines 1-14). However, the cited portion of Thyssen fails to disclose, or suggest, that any of the example types of coding generate a plurality of parameters representing a signal, where the plurality of parameters include a linear prediction calculation vector of quantized linear prediction filter coefficient, a gain parameter based on open-loop lag value, and a residual vector.

Finally, the Office Action took the position that block 980 of Figure 9 of Thyssen discloses the limitation “*when the indicator is not present, outputting a first parametric representation of the speech signal comprising the plurality of parameters, and, when the indicator is present, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified*

parameter,” as recited in independent claim 1, and similarly recited in independent claims 13, 18, 20, and 22-23. Applicants respectfully submit that this position is also incorrect. Thyssen discloses that the selected speech signal coding is actually performed in block 980. (See Thyssen at col. 14, lines 13-14). However, the cited portion of Thyssen fails to disclose, or suggest, outputting a first parametric representation of a speech signal, comprising a plurality of parameters, when an indicator is not present. The cited portion of Thyssen also fails to disclose, or suggest, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter, when the indicator is present.

Therefore, for at least the reasons discussed above, Thyssen fails to disclose, teach, or suggest, all of the elements of independent claims 1, 13, 18, 20, and 22-23. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

Claims 5-12 depend upon independent claim 1. Claims 14-17 depend upon independent claim 13. Claim 21 depends upon independent claim 20. Thus, Applicants respectfully submit that claims 5-12, 14-17, and 21 should be allowed for at least their dependence upon independent claims 1, 13, and 20, and for the specific elements recited therein.

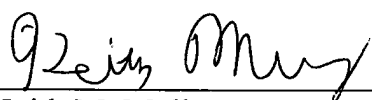
For at least the reasons discussed above, Applicants respectfully submit that the cited prior art references fail to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention

unanticipated and unobvious. It is therefore respectfully requested that all of claims 1, 5-18, and 20-23 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants' respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



Keith M. Mullervy
Registration No. 62,382

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Vienna, Virginia 22182-6212
Telephone: 703-720-7800
Fax: 703-720-7802

KMM:sew:jf